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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

ESTRADA, MICHELLE

ART UNIT PAPER NUMBER

2823

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,463

Applicant(s)

AMAMI ET AL.

Examiner

Michelle Estrada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-14 and 23 is/are allowed.
- 6) ☒ Claim(s) 1-5, 21 and 24 is/are rejected.
- 7) ☐ Claim(s) 6, 22 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ono et al. (6,103,551), Cobbley et al. (6,329,832) and further in view of Izumi et al. (6,262,408).

Ono et al. disclose a connecting step of flip-chip mounting a semiconductor device (6) onto a substrate (9); a bonding step of bonding a region of said semiconductor device to a region of said substrate by means of an adhesive, each of said regions not being involved in electrical connection; and sealing said semiconductor device and said substrate by means of a sealing resin (2) (Col. 6, lines 1-25); wherein said connecting step includes electrically connecting an electrode pad (3) of the semiconductor device to a terminal electrode (8) of the substrate using an electrically conductive adhesive.

Ono et al. do not disclose a testing step of performing a test of electrical properties on said semiconductor device and said substrate that are connected to each other; and separating said semiconductor device from said substrate after heating a bonding place of said adhesive up to a temperature higher than a glass transition point

or a melting point of said adhesive if it is determined that said electrical properties are poor in said testing step, and sealing said semiconductor device and said substrate by means of a resin if it is determined that said electrical properties are good in said testing step.

Cobbley et al. disclose a testing step of performing a test of electrical properties on said semiconductor device and said substrate that are connected to each other (Col. 3, lines 1-3); and separating said semiconductor device from said substrate (Col. 3, lines 10-20) if it is determined that said electrical properties are poor in said testing step (Col. 6, lines 54-58), and sealing said semiconductor device and said substrate by means of a resin if it is determined that said electrical properties are good in said testing step (Col. 3, lines 32-34 and Col. 5, lines 34-48); wherein said bonding step includes curing said adhesive (Col. 2, lines 50-55).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Ono et al. and Cobbley et al. to enable the formation of the semiconductor unit of Ono et al. to be performed according to the teachings of Cobbley et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed formation of the semiconductor unit of Ono et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

Cobbley et al. do not specifically disclose that the separation step is done after heating a bonding place of said adhesive up to a temperature higher than a glass transition point or a melting point of said adhesive.

Izumi discloses heating the adhesive (7) to soften the adhesive and making a separation step when deficiency is found in either one of the two substrates (Col. 9, lines 35-42); wherein the electrically conductive adhesive comprises a thermoplastic; wherein said adhesive comprises a thermosetting resin (Col. 9, lines 19-22); and wherein said adhesive is cured at a temperature lower than said glass transition point of said adhesive in said bonding step.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Ono et al., Cobbley et al. and Izumi et al. to enable formation of the separation step.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ono et al., Cobbley et al. and Izumi et al. as applied to claims 1-4, 21, 22 and 24 above, and further in view of Kohara et al. (4,654,966).

The combination of Ono et al., Cobbley et al. and Izumi et al. does not disclose wherein said adhesive used in said bonding step comprises a low melting point metal.

Kohara et al. disclose that a low melting point metal is a suitable material for adhesive material (11); bonding flip-chips (6) mounted on the module base board (7) and metallic plates (12) (Col. 6, lines 24-30).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Ono et al., Cobbley et al., Izumi et al. and Kohara et al. to enable formation of the adhesive layer.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Ono et al., Cobbley et al., Izumi et al. and Kohara to enable the formation of the adhesive layer of the combination to be performed according to the teachings of Kohara et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed formation of the adhesive layer of the combination and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

Allowable Subject Matter

Claims 6, 22 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-14 and 23 are allowed.

Response to Arguments

In response to applicant's argument that Izumi is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Izumi teaches heating to soften the adhesive and making a separation step when

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deficiency is found in either one of the two substrates, therefore Izumi is concerned about one of the particular problems of the present invention.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues that Cobbley does not disclose that the heating does not form part of the testing/reworking process of Cobbley. However, Cobbley was not relied upon for that purpose. Cobbley was relied on the teaching of testing/reworking, not heating.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Applicant argues that the adhesive paste 3 of Izumi corresponds to the encapsulating resin of Cobbley (and resin 2 of Ono), rather than the presealing connection of the point contacts defined by the epoxy dots 26 in Cobbley. However, the rejection is under USC 103, the primary reference Ono et al. was relied on a connecting step of flip-chip mounting a semiconductor device (6) onto a substrate (9); a bonding

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step of bonding a region of said semiconductor device to a region of said substrate by means of an adhesive; and sealing said semiconductor device and said substrate by means of a sealing resin (2) (Col. 6, lines 1-25); wherein said connecting step includes electrically connecting an electrode pad (3) of the semiconductor device to a terminal electrode (8) of the substrate using an electrically conductive adhesive. Then, the rejection modifies Ono et al. by the separating/sealing step disclosed in Cobbley et al. and explained above. Furthermore, the combination of Ono et al. and Cobbley et al. is modified with adhesive heating step of Izumi that is used for separation when deficiency is found in either one of the two substrates showed in Izumi.

With respect to the arguments of claims 22 and 23, claim 23 was already allowed in the Office Action mailed 12/24/03. Claim 22 is objected to as being dependent upon a rejected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

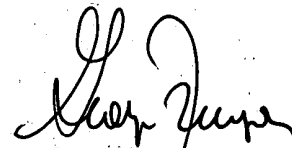
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.



MEstrada
May 28, 2004



George Fourson
Primary Examiner
Art Unit 2823